Climatological Data for July, 1909.

DISTRICT No. 8, TEXAS AND RIO GRANDE VALLEY.

BERNARD BUNNEMEYER, District Editor.

SUMMARY.

The month was warmer than usual throughout the district, especially in Colorado and in much the greater portion of Texas. The precipitation was generally deficient and there was more than the average amount of sunshine. Thunderstorms occurred with less than the usual frequency in most portions of the district, although there was a number of severe storms in New Mexico, with washouts and some damage by lightning. The most noteworthy event of the month was a tropical disturbance which moved inland on the 21st over Brazoria County, Texas, and caused some loss of life and much damage over a broad area extending northwestward as far as Travis and Hays counties.

The rainfall for the district as a whole was deficient. There was, however, a moderate excess over scattered areas in New Mexico, and over a large area in Texas lying south and west of the Colorado River. The excess in New Mexico was due to local thundershowers which were of almost daily occurrence and yielded widely differing amounts in even nearby localities. The excess in Texas was caused by heavy rains attending the tropical storm of July 21.

The precipitation over the Rio Grande watershed was less than the normal, except over its course in Texas from southern El Paso County to Kinney County. Over the extreme upper portion, in Colorado, the amounts ranged from 0.70 inch at Blanca to 1.81 inches at San Luis. Over that portion situated within New Mexico the variation was much greater, ranging from a trace at Los Lunas to over 3 inches in several localities. While the irrigation streams were generally low, they carried sufficient water to fill ditches, but long stretches of the Rio Grande were dry below Albuquerque after the middle of the month. From the southern portion of El Paso County to Kinney County in Texas, the rainfall was greater than over any other stretch of the Rio Grande and ranged from 3 to over 5 inches, the greatest reported being 5.70 inches at Del Rio, while below Kinney County it was considerably less than two inches. In the Rio Pecos watershed there was less variation in the rainfall than in that of the Rio Grande. In general there was a gradual increase in the monthly amounts from north to south, ranging from less than 1 inch in the upper to over 5 inches in the lower Rio Pecos Valley. Throughout the watersheds of the San Antonio and Guadalupe rivers, and of the middle and lower portions of the Colorado River the rainfall was heavy. It was also heavy in the extreme lower valleys of the Brazos and Trinity rivers, and over limited areas of the Nueces. There was a general and in many localities marked deficiency over the watersheds of the upper Colorado, upper and middle Brazos and Trinity, and of the entire Neches and Sabine rivers. The least monthly amount was a trace at Dallas and at Weatherford in the upper Trinity Valley, and the greatest was 9.81 inches at Kerrville in the extreme upper Guadalupe Valley. Most of the heavy precipitation occurred during the short period from the 21st to the 23d. It caused a temporary rise in the rivers, but notwithstanding, the rivers carried much less than the average volume of water. The only exception was the Guadalupe whose mean depth of water for the month averaged slightly above the normal.

The excess of temperature was greatest over the headwaters of the Trinity River, where it averaged over 4° per day, and the least over portions of the upper Rio Grande Valley, with an average of less than 1°.

The monthly mean temperature in the various localities of the district ranged from 63.2° at Windsor, N. Mex., to 91.2° at Fort McIntosh, Tex. In both the Rio Grande and the Rio Pecos valleys the range of temperature was much greater than in the watersheds of the rivers wholly within the confines of the State of Texas, which may be ascribed to their geographical location and to the topography of the country. Thus, Garnett in the extreme upper portion of the Rio Grande Valley had a mean temperature of 64.6°, and Fort McIntosh in the lower portion of that valley, 91.2°. In the Rio Pecos Valley the mean temperature ranged from 63.2° at Windsor in the extreme northern to 85.2° at Barstow, in the southern portion. No such differences occurred in the watersheds wholly within Texas, where the lowest monthly mean was 78.8° at Plainview in the extreme upper Brazos River Valley, and the highest, 89.6° at Hondo in the Nueces Valley and at Waco in the middle Brazos Valley. The diurnal range of temperature was least on the Gulf coast and increased toward the interior. For instance, the greatest daily range at Galveston, Tex., was only 12°, while at Abilene, Tex., it was 32°, and at Magdalena, N. Mex., as much as 52°. The warmest weather of the month occurred from about the 8th to the 18th. During this period temperatures of 100° and over occurred on consecutive days in many portions of Texas and New Mexico. After the 18th the day temperatures became less trying, but the weather continued warm, and there was no perceptible change in the night temperature. In portions of the lower Rio Grande Valley the temperature exceeded 100° almost daily throughout the month. The highest reading recorded was 110° on the 11th in the Rio Pecos Valley, at Carlsbad, N. Mex., and at Barstow and Fort Stockton, Tex. On the same day the lowest temperature of the month, 39°, occurred in the upper Rio Grande Valley, at Chama, N. Mex.

REPORT OF THE TEXAS HURRICANE OF JULY 21, 1909.

This disturbance was first observed on the morning of July 18, 1909, being then apparently central over western Cuba and moving in a northwesterly direction into the Gulf of Mexico. It remained in the Gulf for over three days steadily approaching the Texas coast at the rate of about 10 miles per hour. By 7 a. m. of July 21 it was central at a distance of perhaps 30 miles south southeast of Galveston, whence it moved inland over Brazoria and Wharton counties, breaking up on the following day in southwest Texas near the middle Rio Grande.

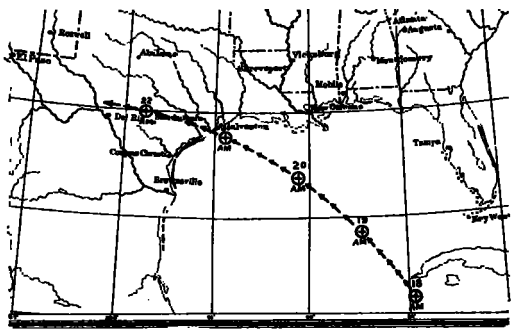

FIG. 1.—Path of Texas storm of July 18–22, 1909.

The path of the storm is shown on the accompanying fig. 1 from the day it was first announced to the day it finally dissipated. Warnings were issued daily from the Central Office of the Weather Bureau at Washington, D. C., and shipping and other interests at all Gulf and Atlantic ports were kept constantly informed of the progress of this disturbance. In consequence there were practically no marine disasters, but the damage on

land was unavoidably great. It is estimated that the total damage in Texas exceeded $2,000,000.00, and 41 persons are reported to have lost their lives in this storm. Fig. 2 shows the storm-swept area, prepared from the best data available. The destructive force of the wind was greatest near the coast and diminished as the storm moved inland. The waves also did much damage. At Galveston the Gulf rose to a height of 10 feet above the normal, and to the westward it rose still higher, submerging the entire western portion of Galveston Island and many miles of the main land. At Velasco the tide was reported 3 feet higher than during the great Galveston storm of 1900. This is probably correct as the center of this storm passed over Velasco, while that of the 1900 storm passed over Galveston, or about 40 miles farther to the northeast. Press despatches gave accounts of many narrow escapes from a watery grave.

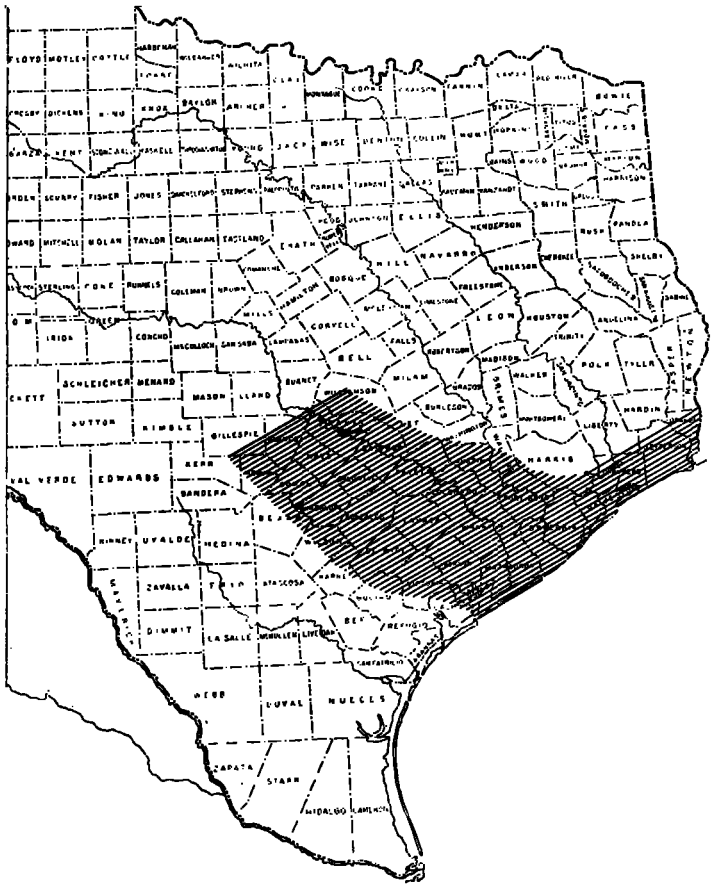

FIG. 2.—The limits of damage in the area visited by the Texas storm of July 21, 1909.

The storm was accompanied by heavy precipitation over the southern half of the State of Texas, except the lower Rio Grande Valley which received no moisture. At Hallettsville the rainfall from this storm amounted to 8.50 inches, and at Kerrville to 8.84 inches, which was the heaviest reported. Salt water was carried inland for many miles. At Bay City, which is about 20 miles from Matagorda Bay, the precipitation had a distinctly salty taste. There are no reports as to the occurrence of lightning and thunder, although a few claim to have seen faint flashes of lightning.

For several days preceding the approach of the hurricane the barometric pressure was above the normal over the eastern half of the country. From July 18 to 21 a well-defined area of high pressure advanced slowly southeastward over the Great Lakes and the Ohio Valley, while in Texas and neighboring States the weather had been for over two weeks, and was then, unusually warm. Assuming that storms follow a path in the direction of least resistance, the cause of the course pursued by this disturbance can readily be understood from the weather conditions prevailing in the Gulf and Atlantic districts.

The lowest corrected barometric reading on the Gulf of Mexico, 29.08 inches, was observed on the S. S. *Paraguay* at 10 a. m., July 20. The lowest corrected reading on land, 29.00 inches, was observed at Bay City at 2.30 p. m., July 21. The maximum time at which the center of the storm appears to have passed a given point has been estimated at one hour. This would make the diameter of the center 10 miles, but it is probable that the diameter increased rapidly over land and was much smaller over the Gulf.

At the time of the storm the writer was on duty at Galveston, and from that place submitted the following immediate report to the Chief of the Weather Bureau:

The tropical storm of July 21, 1909, from a commercial as well as residential point of view has proven of the utmost importance to the city of Galveston. It was a very satisfactory test of the protection of the sea wall which was built after the destructive hurricane of 1900. Not a single life was lost within the protected area and the damage to property was only nominal, consisting principally of broken trees, fences and windows, and other minor losses. Outside of the sea wall everything exposed to the wind and waves was either destroyed or suffered severely. Among the property completely lost were two bathing pavilions, two fishing piers leading out from the sea wall, several structures near the beach beyond the western terminus of the sea wall, and two fishing piers on the jetties several miles east of Galveston. One other bathing pavilion was badly damaged.

FIG. 3.—Sea wall and pavilion at Galveston, Tex. The riprap at the bottom and the curved face of the wall break the force of the waves. The pavilion was destroyed by the storm of July 21, 1909.

The railroad bridge over the bay suffered to some extent, and traffic as well as telegraphic and telephonic communication was interrupted. Washouts occurred in several places. The total damage is estimated at $100,000., and may possibly be greater.

The two fishing piers on the jetties were occupied on the day of the storm. The occupants of one of these piers were taken off before it was demolished; those of the other pier, consisting of 11 persons, went down with the structure, not, however, until after several heroic efforts had been made to save them. Seven of the 11 occupants were picked up alive on the following day by searching parties at a distance of 25 miles from the pier; three were picked up dead, and one is still unaccounted for and probably lost.

There was no damage to shipping, except that a few small boats were lost. The sloop *Ellen*, a fishing boat, was towed into port after the storm, with masts and rigging gone. Her captain, who was in a small boat at the time, was lost, struck by the boom during a gust of wind, as he was trying to board his sloop. He was probably instantly killed. The situation may be summed up as follows: Four persons dead and one person unaccounted for, property loss about $100,000, nearly all of which occurred outside of the sea wall.

The first announcement of the approach of this storm was received at this office at 12:57 p. m., July 18, 1909, the advisory message coming from Washington through New Orleans. This was followed by further advisory messages received 1:05 p. m., July 19, and 9:45 a. m., July 20, the last message being to the effect that the disturbance was apparently over the central Gulf moving northward. Shipping interests and the public were kept thoroughly posted by telephone, bulletins, and the press, and I do not believe that on July 20 there was a single news-reading person in the city who was not aware of this storm. The weather was fine on July 19, and the sunset of that day was beautiful, showing in succession nearly all the colors of the rainbow over

the greater portion of the sky. The 20th, which was the day before the storm, opened clear. Toward noon a cirrus haze began to overspread the sky, which became slowly denser during the afternoon and gradually merged into alto-stratus clouds. By nightfall the sky was overcast, but later cleared, with clouds remaining in the eastern horizon. The wind was light until 7:00 p. m. when it shifted to the northeast, increasing in force and coming in mild gusts. At 8:40 p. m., the wind became north, but continued gusty. The highest velocity to midnight was 26 miles. There was a heavy sea swell and the Gulf was unusually high.

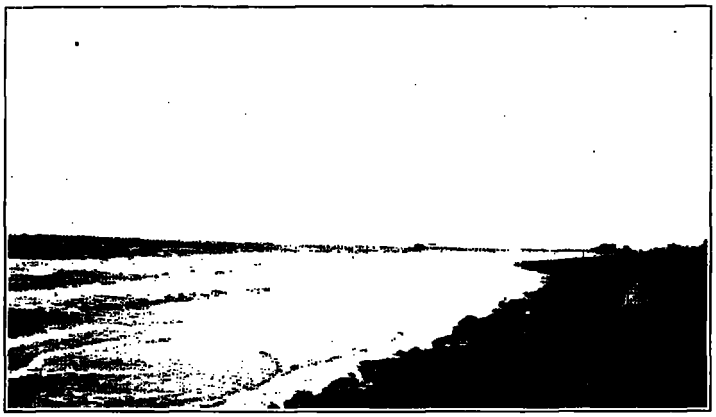

FIG. 4.—The sea wall at Galveston, Tex.; length, 19,594 feet; height, 17 feet above mean low tide; cost, $1,295,275.

The wind continued north throughout the night and until 8:40 a. m., July 21, when it became northeast, gaining steadily in force with frequent violent gusts. Immediately after the morning observation, at 7:15 a. m., storm warnings were displayed, but the halyards parted at about 9:00 a. m. from the immense strain to which they were subjected. At 10:25 a. m. the wind shifted to the east, and at 10:50 a. m. attained a velocity of 68 miles per hour for five minutes. During this high velocity a gust of one minutes' duration occurred at the rate of 78 miles per hour. At 11:40 a. m. the wind became southeast and continued in that quadrant until after the storm. At 11:45 a. m., one of the wires connecting with the anemometer snapped at the binding post and for 12½ minutes there was a blank in the wind record. The anemometer, however, showed that during this period the wind traveled 14 miles. At about 12:35 p. m., there was a marked decrease in the violence of the wind and from this time on it lessened steadily but slowly. At 2:00 p. m. the wind record was again broken, but this time it was found to be due to the mechanism of the anemometer dial, and the extra anemometer was substituted, which cured the defective record.

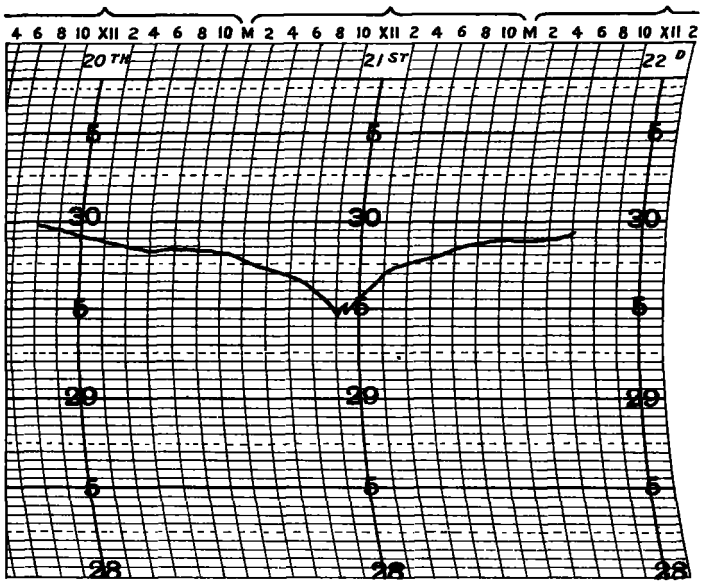

FIG. 5.—Barogram during the storm of July 21, 1909.

During the day the sky was covered with low stratus clouds and scud which moved rapidly with the surface wind. Rain occurred from 5:11 a. m. to 5:28 a. m. and from 5:45 a. m. to 12:40 p. m., but most of the time it was a very light driving drizzle. The total precipitation for the day was 0.50 inch. It is my opinion that much of this drizzle was spray driven in from the Gulf. It was subsequently found that nearly all trees and shrubbery, except palms, withered on the windward side, the leaves appearing scorched as by a fire and dropping off. It is believed that this phenomenon was caused by the action of salt water carried inland by the wind.

The action of the barometer is best shown by the barograph tracing, fig. 5.

A correction of 0.05 inch should be applied to this tracing. Half hourly barometer readings were, however, taken by Mr. H. H. Martin, with the following result:

Time.	Barometer reduced to sea level.	Time.	Barometer reduced to sea level.
7:00 a. m.	29.76	11:00 a. m.	29.58
7:35 a. m.	29.74	11:35 a. m.	29.62
8:00 a. m.	29.71	12:00 noon	29.64
8:35 a. m.	29.69	12:30 p. m.	29.68
9:01 a. m.	29.65	2:00 p. m.	29.75
9:30 a. m.	29.64	2:15 p. m.	29.80
10:05 a. m.	29.56	2:45 p.m	29.83
10:30 a. m.	29.57	3:30 p. m.	29.83
		4:05 p. m.	29.86

The lowest pressure was 29.557 inches at 10:05 a. m. From the direction of the wind, which was successively N., NE., E. and SE., it appears that the center of the storm passed south of Galveston. Press dispatches later had it that there were two storms at Velasco, Brazoria County, and at Bay City, Matagorda County, the first coming from the north and the second from the south. This indicates that the storm center moved inland over Velasco and Bay City, and that it passed about 25 miles south of Galveston.

The Gulf, it is estimated, rose to a height of nearly 10 feet above the normal and the entire western portion of Galveston Island was under water, drowning a large number of cattle and hogs. Volumes of water dashed over the sea wall and flooded successively the lower portions of the city. It was after 2:00 p. m. before this water finally disappeared through the drainage pipes.

The local office of the Weather Bureau was besieged by anxious inquirers during the entire day. From 4:00 a. m. until 7:00 a. m. Messrs. Scott and Martin answered all telephone calls, and after 7:00 a. m. Mr. W. P. Stewart was kept constantly busy at the telephone, advising people in the threatened sections to move into town to safer places, and that no assurance could be given until after the barometer should begin to rise. Thousands of people came down town and sought refuge in the county court house, public library, hotels and office bulidings, the police and fire departments assisting in conveying them to safety. Our own office building was crowded from top to bottom. During the height of the storm the largest office window was blown in, the thermograph upset, and the station maximum thermometer broken.

Four special reports of the progress of the storm were sent to your office and one to New Orleans, but it is feared that some of them failed to reach their destination in time, as communication was cut off. Two messages, both sent from your office on July 21, did not reach this office until the following day.

The entire station force behaved admirably under trying circumstances.

The following are extracts from reports received, which throw much additional light upon the extent and severity of this tropical storm:

REPORT OF MR. W. F. BERG, MASTER OF THE S. S. PARAGUAY.

The following is a brief description of a hurricane which we encountered in the Gulf of Mexico during our last voyage from Sabine Pass, Tex., to Marcus Hook, Pa.

We left Sabine Pass on July 18, at 6 p. m. We had noticed storm signals set indicating that a storm was expected from the southeast. The weather was then clear, with a fresh southeast breeze and moderate sea. These conditions continued until shortly after noon of the following day, when the wind came from the northward. By 8 p. m., the wind had increased in force to a strong gale, with very high sea and cloudless skies. Our latitude at noon was 28° 27′ north, longitude 91° 16′ West. At midnight the skies had become overcast, the wind and sea remaining the same as at 8 p. m.

July 20, 8 a. m., the wind was still from the northward, blowing a strong gale, with frequent heavy squalls, heavy rain and a heavy cross sea. At 10 a. m., the wind died away altogether. The sky continued overcast, but much lighter than before, and the sea was very much confused although not very dangerous. At 11 a. m., the barometer read 29.10 inches (lowest) and the wind sprang up from the southward blowing full hurricane force, accompanied by very heavy rain, lasting until nearly 4 p. m. without a perceptible break. About 4 p. m., the weather became squally, the squalls gradually becoming less violent, with longer intervals until at midnight we were able to proceed on our course, the wind at that time being a strong southeast breeze with a clear sky and a rough sea.

The following barometer readings were taken during the disturbance:

	Inches.		Inches.
July 19, 4:00 p. m.....	30.08	July 20, 2:30 p. m.....	29.55
July 19, 8:00 p. m.....	29.98	July 20, 3:00 p. m.....	29.61
July 19, Midnight.....	29.92	July 20, 3:30 p. m.....	29.66
July 20, 4:00 a. m.....	29.81	July 20, 4:00 p. m.....	29.70
July 20, 8:00 a. m.....	29.43	July 20, 4:30 p. m.....	29.70
July 20, 10:00 a. m.....	29.10	July 20, 5:00 p. m.....	29.65
July 20, 12 Noon.....	29.13	July 20, 5:30 p. m.....	29.66
July 20, 12:30 p. m.....	29.30	July 20, 5:50 p. m.....	29.78
July 20, 1:00 p. m.....	29.36	July 20, 6:50 p. m.....	29.83
July 20, 1:30 p. m.....	29.44	July 20, 7:10 p. m.....	29.88
July 20, 2:00 p. m.....	29.50	July 20, 8:50 p. m.....	29.90

The foregoing readings were taken from an aneroid barometer, which was compared with a standard barometer at Philadelphia, Pa., and found to read 0.02 inch too high.

REPORT OF THE STORM AT ANGLETON AND VELASCO, BY MR. W. P. STEWART.

On the way to Velasco the effects of this storm were first seen at Danbury, Tex., a village about 20 miles north of Velasco. At this place two buildings had been blown down.

At Angleton, a town of 800 inhabitants, about 15 miles north-northwest of Velasco, about one-half the houses had been destroyed, many of them substantial brick structures. Of the buildings left standing nearly all had been more or less damaged. The débris was strewn toward the north-northwest. I was informed that high northerly wind prevailed during the forenoon of July 21. It shifted to the southeast and south about 12:30 p. m. and immediately attained hurricane force. There was some clearing of the sky as the center passed, but only a slight lull in the wind. Rebuilding is being pushed rapidly at this place.

On the way from Angleton to Velasco the wrecks of many farm buildings were seen. Apparently the newer houses were left standing. In the timber along the Brazos River Valley many trees were uprooted or broken off. Those at the bottom were from the northeast, those on top from the southeast or south. Corn stalks and other light débris invariably lay from the south, showing that the last blow was from that direction.

At Velasco, which had been a town of 600 people, apparently one-half of the town was destroyed. Here the wind was nearly as strong from the north as from the south. The storm-warning tower of the Weather Bureau was wrecked before the wind shifted to the south. There was a calm of about 45 minutes at the center, and for a few minutes the sun came out. The wind shifted to south about 12:30 p. m. Of the buildings left standing a large number leans toward the north. It is said that at Velasco the tide was 3 feet higher than during the great storm in 1900. It is evident that the earlier estimate that the storm center passed about 25 miles south of Galveston was approximately correct.

REPORT OF MR. R. B. LOGGINS, COLUMBIA, TEX.

On July 21 we had two storms at this place with a lull between them lasting from one-half to three-quarters of an hour—long enough for us to come from our retreat to the house, serve dinner and eat. These storms came from directly opposite directions, the former from a little west of north, and the latter, which was the more severe, from a little east of south. Both were severe. The former prostrated shade trees and fences, and unroofed houses, and the latter tore down whatever was left. There was no loss of life in this community. One negro woman on my place was hurt, but not seriously. All tenant and outhouses were destroyed, but the dwelling was left standing, though wet and somewhat knocked out.

REPORT OF MRS. MARY A. STEVENS, BRAZORIA, TEX.

The storm in the morning was northwest by north. After 10 a. m. it increased suddenly in violence. About noon there was a lull for almost one hour; then the return wind struck fast and fierce—seemingly worse than in 1900—decidedly worse than in the morning. It lasted until 4 p. m. During the afternoon the wind blew mainly from the south and southwest. At 10:30 a. m., the rain gage blew over and the amount of rainfall has been estimated.

REPORT OF MR. E. C. QUEREAU, BAY CITY, TEX.

I forward you a few data on the recent West Indian hurricane as observed by me at Bay City, Tex. I have a compensated aneroid barometer of English make and noted that it registered 30.2 inches at 8 a. m. My barometer has not been compared with a mercurial for a long time, but by watching the isobars on the weather maps, I judge that it reads about 0.2 too high. However, I will give you actual readings.

At about 12 m. of the 21st, it had fallen to 29.5 inches, with a strong wind blowing from the north. At 1 p. m. it read 29.3 inches, and the wind shifted to north of west. At 2:30 p. m. it read 29.2 inches, the lowest point reached, with wind from the west, increasing to a terrific gale, which was estimated at from 70 to 75 miles per hour. The barometer remained at 29.2 inches until about 3:30 p. m., when it began to rise slowly. The wind shifted to southwest and later to south, but did not slacken perceptibly for half an hour after the barometer began to rise. By 5:30 p. m. the wind had died out and the barometer returned to 30.2 inches. The rainfall was excessive during the storm. A tub I put out was blown away, and there were very few things that were not blown away. A neighbor had a pail in a tree which was filled (about 12 inches). The country here is very flat, but water filled the roads and fields until the ground was out of sight under several inches of water. Evidently the center of the storm passed east of Bay City, but probably not far. Destruction to buildings was very great in this city and east of the Colorado River, but there was not much damage west of that river.

A friend from Rock Island, near Eagle Lake, reported that the wind there started in from the north when there was a lull for nearly an hour. It then shifted to the south and was very destructive. Evidently the center of the storm passed over that place.

REPORT OF MR. C. R. SWISSHELM, BAY CITY, TEX.

The morning of July 21 dawned cloudy, with light rain and very little wind. About 9:30 or 10:00 a. m., the wind became stronger and at noon commenced to tear down awnings and signboards. About 1:30 p. m., our hotel, which was a large frame building, began to rock and we moved to a small brick building across the street and remained there for probably one half hour, when the wall of the opera house next door gave way and fell through the roof of our shelter, but the wooden ceiling held the brick long enough to allow us to escape. We then moved to another brick building immediately adjoining, but left it in about five minutes, because its roof blew off. We then retreated to the building which contained the post-office. The walls of this building held, but all its windows were blown in. The storm ceased about 6:30 p. m. The damage was all done between noon and 6 p. m.

I was slightly confused in the points of the compass, but to the best of my knowledge the wind began from the northwest and gradually shifted to the west, south, and southeast. There was no lull during the storm. The velocity of the wind was estimated by several people at about 110 miles per hour, and that is also my estimate. The wind was strong enough to pick up pieces of wood 6 inches in diameter and 3 feet long and hurl them through the air. It rained incessantly, but there was no lightning or thunder, and the water that fell had a distinct taste of salt and stung the eyes. The wind came in gusts and in several instances knocked holes in brick walls, but left the walls standing. Several buildings had the front blown in and the rear blown out.

The warehouse and cotton gin district was completely wiped out. Many residences were blown off their foundation, but were otherwise not seriously damaged. The frame buildings seemed to suffer less than the brick. There was scarcely a frame house left standing between Bay City and Wharton. The town of Van Vleck had only three houses left standing and they were badly damaged.

REPORT OF MR. F. P. LUND, MIDFIELDS, TEX.

The center of the storm passed over El Campo, Tex., where there was a lull in the wind from about 4:20 p. m. to 4:40 p. m., when the wind blew from a nearly opposite direction.

At Midfields, the wind commenced to blow from the north and gradually shifted to the southwest.

My aneroid barometer read 30.24 inches in the morning and by 1 p. m. had fallen to 29.53. At two o'clock it read 29.33 and remained stationary until 3 p. m., when it rose to 29.45. At four o'clock, it again fell to 29.33, but by 5 p. m. had risen to 29.45 and continued to rise until it read 30.24 inches.

NOTE:—The aneroid barometer used by Mr. Lund in his observations seems to read from 0.2 to 0.3 inch too high.

REPORT OF DR. J. E. LAY, HALLETTSVILLE, TEX.

The storm of July 21 was the worst ever known in this community. I have been a resident here since 1850 and nothing like it has been known in my experience. I have measured the rainfall since 1872 and have never known more than 6 inches to fall in one storm, but on this occasion there fell 8.5 inches before it ceased. The wind must have blown at least 55 or 60 miles per hour. The velocity is only estimated as I have no anemometer, but taking into consideration the damage done to crops, outhouses, windmills and other things in general, it must have reached or exceeded that velocity.

From the despatches from Galveston, the storm center must have struck the coast between that city and Corpus Christi and if it did, it must have been deflected inland and to the northward. I judge so from the course the wind took at this place which evidently shows that the storm center passed east of us between this place and Houston.

On the 20th the barometer began to fall, the temperature being about 100°. Press despatches showed that a storm was in the east Gulf and I feared it would come this way for the whole of Texas was a seething furnace with the barometer comparatively low. I stated these facts to my friends and my prediction was correct.

About 3 p. m. of the 21st, the wind freshened from a northerly direction, with an already cloudy sky, and continued to gain in velocity. The barometer continued to fall and by 5 p. m., the storm was upon us increasing in force until about 8:30 p. m., when the barometer ceased to fall, remained

stationary for a few minutes, and then began to rise with great rapidity. After this the wind slowly abated and by 9:30 p. m. had shifted, by way of west and south, to the southeast where it died away. From the course the wind took, I suppose the center passed east and toward the interior, northward of us.

During the entire storm, the rain fell in torrents putting the water courses up very high. The damage to crops is very great, but can not be accurately estimated at this time.

With the tempest howling, the rain beating through every place thought to be secure, the trees crashing and now and then torn up by the roots that had held them secure against every storm for a hundred years or more, and total darkness prevailing, this was the most awful night I have ever experienced. The most consoling thought is that there was no loss of life.

REPORT OF JULIUS LAUX, FLATONIA, TEX.

During the storm of July 21, both my thermometer shelter and raingage were blown over, but I am glad to say were not damaged, although I lost my rainfall record. The storm was very severe. Considerable damage was done to shade trees and store buildings, but very little to dwellings. A number of outhouses and barns was blown down. Some private rain gages which heretofore agreed closely with mine showed 5.75 inches of precipitation.

TABLE 1.—*Climatological data for July, 1909. District No. 8, Texas and Rio Grande Valley.*

Stations.	Counties.	Elevation, feet.	Temperature, in degrees Fahrenheit.								Precipitation, in inches.				Sky.				Observers.
			Length of record, yrs.	Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall unmelted.	Number of rainy days, .01 inch or more.	Number of clear days.	Number of partly cloudy days.	Number of cloudy days.	Prevailing wind direction.	
Colorado.																				
Amethyst (near)	Mineral	8,730	1																	
Blanca	Costilla	8,403		65.7		90	8	40	28	45	0.70		0.26	0.0	5	12	19	0	sw.	L. C. Audrain.
Cumbres	Conejos	10,015	3																	Venita A. Good.
Garnett	Costilla	7,576	16	64.6	+ 3.3	91	13	40	11	49	0.95	− 0.25	0.50	0.0	5	8	22	1	sw.	Chas. Speiser.
Hermit	Hinsdale	9,843																		C. C. Mason.
La Veta Pass	Costilla	9,000									1.57		0.80	0.0	5	16	8	7	w.	Norvin R. Lively.
Manassa	Conejos	7,700	3																	J. B. Chapman.
Platoro	do	9,675	2																	Walter R. Hook.
Saguache	Saguache	7,740	17																	Eugene Williams.
San Luis	Costilla	7,794	18	64.4[d]	+ 1.7	86	11†	41	10†	43	1.81	− 0.54	0.55	0.0	13	15	16	0	sw.	P. B. Albright.
Wagon Wheel Gap	Mineral	8,434	10																	Ellwood Bergey.
New Mexico.																				
Agricultural College	Dona Ana	3,863	43	81.2	+ 0.4	106	12	62	6	39	0.71	− 1.13	0.48	0.0	6	7	23	1	sw.	N. M. Agric. College.
Alamogordo (near)	Otero	4,338	9	80.2		108	10	61	1	36	0.62		0.48	0.0	2	9	19	3	sw.	Jas. C. Dunn.
Alamogordo	do	4,320									1.22		0.64	0.0	4					Agent E. P. & S. W. R. R.
Albuquerque	Bernalillo	5,200	34	79.6[e]	+ 2.4	100[e]	12	60[e]	15	36[e]	0.83	− 0.31	0.33	0.0	6	15	11	0	s.	University of N. M.
Amizett	Taos	9,018									1.78		0.80	0.0	13	8	20	3	w.	Geo. W. Oates.
Ancho	Lincoln	6,112									3.00		1.00	0.0	5					Agent E. P. &S. W. R. R.
Aspen Grove Ranch	Rio Arriba	9,000											0.65	0.0	4					Junius D. Maupin.
Bateman Ranch	do	8,900												0.0	14	7	12	12	w.	John W. Bateman.
Bluewater	Valencia	6,732	8	71.2		94	8†	45	29	48	1.63		0.47	0.0	7	13	15	3	w.	Bluewater Developm't Co
Bluewater Reservoir	do	9,000									1.75		1.00	0.0	3	24	7	0	w.	Do.
Boas	Chaves	4,154		78.0		104	11	59	18†	39	1.57		0.82	0.0	5	15	13	3	se.	D. C. Savage.
Capitan	Lincoln	6,348									2.27		0.50	0.0	13	14	15	2		Agent E. P. & S. W. R. R.
Carlsbad	Eddy	3,120	15	82.0	+ 2.0	110	11	64	18†	40	3.66	+ 0.35	1.09	0.0	9	7	17	7	se.	U. S. Reclamation Serv.
Carrizozo (1)	Lincoln	5,429	2	75.5		101	10	57	29	39	2.58		1.01	0.0	10	2	26	3		A. H. Harvey.
Carrizozo (2)	do	5,438									3.68		1.09	0.0	10	18	8	5	sw.	Agent E. P. & S. W. R. R.
Chama	Rio Arriba	7,851	8	66.0		90	12	39	11	50	2.33	+ 0.13	0.70	0.0	8	20	10	1	sw.	Frank C. Johnson.
Cloudcroft (1)	Otero	8,650	7																	M. P. Coakly.
Cloudcroft (2)	do	8,650									4.69		1.20	0.0	13	14	4	13		Agent E. P. & S. W. R. R.
Corona	Lincoln	6,666									2.93		1.00	0.0	5	0	23	8	s.	Do.
Coyote	do	5,800									1.10		0.55	0.0	6				c.	Do.
Cundiyo	Santa Fe	6,889									0.80		0.26	0.0	7	8	20	3	w.	Teofilo Vijil.
Demonstration Farm	San Miguel	6,800	1								2.72		1.04	0.0	7					Erb and Westerman.
Duran (1)	Torrance	6,272	1	73.4		100	10	46	25	36	0.64		0.15	0.0	8	7	19	20	w.	W. H. Birkhead.
Duran (2)	do	6,272																		Agent E. P. & S. W. R. R.
Edison Mine	Taos	10,600																		Frank L. Paxton.
Elk (near)	Chaves		10	68.8	− 1.6	93	11	53	24†	37	5.84	− 0.13	2.87	0.0	9	6	22	3	c.	Boyd Williams.
Escondido	Otero	4,014									1.42		0.44	0.0	6	5	15	11	w.	Agent E. P. & S. W. R. R.
Española	Rio Arriba	5,590	13	74.9	+ 3.0	99	12	48	10	48	0.48	− 1.03	0.37	0.0	3	15	11	5	sw.	Mrs. E. F. McBride.
Estancia	Torrance	6,140	4	71.3[a]		102[a]	10	49[a]	19†	50[a]	0.99		0.27	0.0	9	16	14	1	e.	Agent N. M. Cent. R. R.
Fort Stanton	Lincoln	6,231	30	70.3	+ 1.2	94	10†	48	1	40	3.28	+ 0.31	1.40	0.0	11	17	10	4	s.	U. S. Sanitarium.
Fort Sumner	Guadalupe	3,960	7	79.2		105	11	56	27	48	1.06		0.48	0.0	7	28	2	1	s.	F. A. Manzonares.
Gallinas	Lincoln	6,635									1.76		0.58	0.0	10	12	15	4		Agent E. P. & S. W. R. R.
Gallinas Planting Stat'n.	San Miguel	7,500	3	66.1		89	11	43	28	41	5.11		1.40	0.0	13	2	24	5	nw.	U. S. Forest Service.
Harvey's Upper Ranch	do	9,400									5.41		1.47	0.0	14	7	16	8	nw.	Simon B. Warner.
Hillsboro	Sierra	5,224	10	77.8[a]	+ 1.4	102[a]	13	60	14†	35[a]	1.26	− 0.98	0.30	0.0	7	24	7	0	w.	J. M. Webster.
Hodges	Taos	8,484									2.63		0.87	0.0	5	16	4	11	nw.	Ralph W. Johnson.
Hondo Reservoir	Chaves	3,904	1	79.6		107	11	62	2†	39	2.62		1.07	0.0	6	19	9	3	sw.	U. S. Reclamation Serv.
Hope	Eddy		3																	N. L. Johnson.
Hopewell	Rio Arriba	9,500									0.23		0.29	0.0	10	3	19	9	sw.	John T. Blanton.
Laguna	Valencia	5,840	5	75.6		101	12	54	5†	43	1.45		0.50	0.0	4	10	6	15	w.	Gus Weiss.
Lagunita	Guadalupe	4,500	5	77.5[e]		96[e]	6	56[e]	30	31[e]	0.65		0.38	0.0	5	23	5	3	sw.	P. A. Turnbull.
La Huerta	Eddy	3,111	1								3.67		1.62	0.0	8	16	12	3	se.	D. Barclay Sutherland.
Lake Valley	Sierra	5,415	5								1.42		0.28	0.0	12	0	30	1	sw.	Wm. P. Keil.
Las Vegas	San Miguel	6,384	23	72.0	+ 2.9	99	11†	44	16	48	1.53	− 2.54	0.42	0.0	11	20	10	1	s.	Dr. Wm. C. Bailey.
Los Lunas (near)	Valencia	4,900	18	78.4	+ 1.4	103	11	57	8†	44	T.	− 1.03	T.	0.0	0	7	23	1		Richard Pohl.
Los Tanos	Guadalupe	4,919									1.95		0.60	0.0	7				s.	Agent E. P. & S. W. R. R.
Magdalena	Socorro	6,557	4	72.6		102	14	50	14†	52	3.58		0.90	0.0	8	1	30	0	w.	Wm. Pender.
Mineral Hill	San Miguel	7,050	5								3.57		1.13	0.0	7	6	19	6	sw.	W. M. Nelson.
Monument	Eddy	3,500	4																	James M. Cook.
Mountainair	Torrance	6,547	7	72.4		98	12	51	24	43	2.31		0.52	0.0	9	14	17	0	sw.	John W. Corbett.
Newman	Otero	3,989									0.74		0.58	0.0	3	24	7	0		Agent E. P. & S. W. R. R.
Noria	Dona Ana	4,414									1.61		0.80	0.0	6	6	24	1	sw.	Do.
Orogrande	Otero	4,171									0.17		0.06	0.0	5	5	19	7	w.	Do.
Oscuro (near)	Lincoln	5,016									2.11		0.80	0.0	11					Eugene F. Jones.
Oscuro (2)	do	5,016									1.94		0.99	0.0	14	6	18	7	se.	Agent E. P. & S. W. R. R.
Otis	Eddy	3,100									3.21		1.14	0.0	6	26	2	3	se.	A. M. Hove.
Otto	Santa Fe	6,200									1.27		0.39	0.0	9					Otto Goetz.
Pastura	Guadalupe	5,285									0.34		0.14	0.0	3	28	0	3	w.	Agent E. P. & S. W. R. R.
Red River	Taos	8,650																		Mrs. L. R. Penn.
Rincon	Dona Ana	4,030	11	80.8	+ 1.7	106	12	60	29	38	1.27	− 0.68	0.52	0.0	3	5	16	10	e.	Chas. H. Raitt.
Rio Grande Dam	Sierra	4,265	11	81.1	+ 3.2	106	12	61	6	37	2.70	+ 0.58	0.99	0.0	13	7	19	5	s.	U. S. Reclamation Serv.
Rosedale	Socorro	6,910	5	70.6		93	12	53	24	32	1.48		0.59	0.0	13	14	6	11	w.	W. H. Martin.
Roswell	Chaves	3,578	12	79.0	+ 0.1	105	11	62	22	37	1.94	− 1.52	1.04	0.0	7	10	18	3	s.	U. S. Weather Bureau.
San Marcial	Socorro	4,439	14	79.2	+ 2.2	101	12	60	27†	39				0.0	6	9	17	5	se.	Agent A. T. & S. F. R. R.
San Rafael	Valencia	6,509	6	75.0		100	14	50	30	44	2.64	+ 0.70	1.38	0.0	7	18	10	3	w.	Dr. C. M. Grover.
Santa Fe	Santa Fe	7,013	37	69.8	+ 1.1	91	12	52	27	23	2.39	− 0.32	0.70	0.0	16	7	24	0	e.	Section Center.
Santa Rosa (1)	Guadalupe	4,624	10	78.6		103	11	58	1	41	3.90		0.75	0.0	13	9	22	0	s.	John L. Chapman.
Santa Rosa (2)	do	4,624									2.53	− 0.35	0.80	0.0	8					Agent E. P. & S. W. R. R.
Socorro	Socorro	4,600	19	77.8	+ 0.3	102	11	50	14	45	1.73	+ 0.13	0.31	0.0	8	23	7	1	s.	J. J. Leeson.
Stanley (near)	Santa Fe	6,317		70.6		97	12	45	29	50	1.45		0.75	0.0	5	19	4	8		L. J. Cartwright.
Strauss	Dona Ana	4,080	11								0.35	− 1.12	0.10	0.0	4	17	9	5	nw.	Agent Southern Pac. R.R.
Taos	Taos	6,983	12																	Alexander Gusdorf.
Taos Canyon	do	8,959											0.49	0.0	10					Leocadio Martinez, jr.
Tecolote	Lincoln	6,539									3.35		1.70	0.0	11	12	11	8	w.	Agent E. P. & S. W. R. R.
Three Rivers	Otero	4,559									1.32		0.40	0.0	10	13	13	5		Do.
Torrance	Torrance	6,433									3.14		1.20	0.0	8					Do.
Tres Piedras	Taos	8,076	5	67.0		90	12†	44	28	41	1.75		0.65	0.0	5	14	13	4	sw.	Edwin B. Seward.
Truchos	Rio Arriba	7,935				86	14†				0.95		0.35	0.0	4	4	27	0		Ignacio Cordova.
Tularosa (1)	Otero	4,436	2	78.8[d]		104[d]	12	60[d]	16	37[d]	1.85		0.84	0.0	8	3	27	1	sw.	Irby L. Fairless.
Tularosa (2)	do	4,436									0.80		0.75	0.0	4	12	9	10	sw.	Agent E. P. & S. W. R. R.
Vaughn	Guadalupe										2.54		1.30	0.0	10	7	19	5	sw.	Do.
Winsors	San Miguel	8,200	12	63.2	+ 4.7	90	14	39	8†	49	5.16	+ 0.86	1.26	0.0	12	4	17	10	w.	Henry D. Winsor.
Texas.																				
Abilene	Taylor	1,738	24	84.8	+ 2.6	103	11	68	15	32	1.09	− 1.31	0.32	0.0	6	9	19	3	s.	U. S. Weather Bureau.
Albany	Shackleford	1,429	15	86.0	+ 4.4	106	10	65	15†	34	1.83	− 1.60	1.53	0.0	5	28	3	0		N. L. Bartholomew.

TABLE 1.—*Climatological data for July, 1909. District No. 8*—Continued.

Stations.	Counties.	Elevation, feet.	Length of record, yrs.	Temperature, in degrees Fahrenheit.							Precipitation, in inches.				Sky.				Observers.
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall unmelted.	Number of rainy days, .01 inch or more.	Number of clear days.	Number of partly cloudy days.	Number of cloudy days.	Prevailing wind direction.	
Texas—Cont'd.																				
Alvin	Brazoria	49	10	.....	.....	.....	.....	.....	.....	.....	3.89	− 3.57	1.89	0.0	5	13	13	5	s.	F. A. Smith.
Anahuac§	Chambers	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.33	.....	1.73	0.0	6	.....	.....	.....	.....	B. H. Collins.
Austin	Travis	650	23	84.7[a]	− 0.4	98[a]	11	71[a]	22	22[a]	2.86	+ 0.08	2.62	0.0	5	11	18	2	sw.	A. Deussen.
Ballinger§§	Runnels	1,637	14	85.1	+ 3.2	108	10	66	26	34	1.82	− 1.38	1.55	0.0	2	24	3	4	s.	E. M. Eubank.
Barstow	Ward	2,573	2	85.2	.....	110	11†	65	23	34	4.50	.....	1.80	0.0	5	26	3	2	se.	W. H. Denis.
Beaumont	Jefferson	29	12	85.4	+ 2.8	99	4†	71	20	26	2.54	− 2.16	1.18	0.0	8	16	0	15	se.	Jno. Bender.
Beeville§§	Bee	225	13	84.5	− 0.6	99	17	69	31[e]	26	4.17	+ 0.22	1.62	0.0	5	16	12	3	se.	L. E. Dickey.
Big Springs	Howard	2,396	7	85.3	.....	109	10†	64	23	32	0.65	.....	0.33	0.0	7	8	21	2	s.	B. Reagan.
Blanco§§	Blanco	1,350	13	84.5	+ 1.3	103	17	68	22	30	4.64	+ 1.12	3.60	0.0	3	22	8	1	s.	R. A. Crist.
Boerne	Kendall	1,412	17	83.6	+ 2.0	103	10†	62	31	37	6.90	+ 3.55	6.50	0.0	2	20	6	5	s.	F. W. Schweppe.
Booth§§	Fort Bend	81	8	.....	.....	.....	.....	.....	.....	.....	2.84	.....	1.29	0.0	7	25	0	6	se.	T. R. Booth.
Boquillas	Brewster	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	M. A. Ernst.
Bowie	Montague	1,113	9	87.8	.....	106	11†	71	21†	30	0.85	.....	0.46	0.0	4	16	15	0	s.	Craig Anderson.
Brazoria	Brazoria	25	20	83.6	+ 2.2	101	16	72[a]	9†	29	7.61‖	+ 1.39	5.00‖	0.0	8	27	3	1	s.	Mrs. M. A. Stephens.
Brazos	Palo Pinto	801	.....	.....	.....	.....	.....	.....	.....	.....	2.16	.....	1.02	0.0	3	25	5	1	sw.	Robt. E. Boyett.
Brenham§§	Washington	350	20	85.6	+ 1.3	100	11†	72	20	25	1.73	− 1.82	1.30	0.0	5	16	9	6	se.	Mrs. B. F. Sloan.
Bridgeport§§	Wise	754	.....	.....	.....	.....	.....	.....	.....	.....	0.23	.....	0.12	0.0	2	27	1	3	s.	Thos. C. West.
Brighton	Nueces	12	13	83.8	.....	92	21†	73	19	18	0.05	.....	0.05	0.0	1	25	5	1	se.	G. H. Ritter.
Brownsville	Cameron	38	20	84.4	+ 1.3	99	21	72	1†	24	1.60	− 0.27	1.25	0.0	4	.....	.....	.....	s.	U. S. Weather Bureau.
Brownwood§§	Brown	1,342	19	86.6	+ 3.0	108	15	69	24†	32	0.47	− 1.64	0.14	0.0	5	20	9	2	s.	Mrs. Pearl Smith.
Cameron§§	Milam	.....	1	88.2	.....	106	14†	72	18	33	0.03	.....	0.02	0.0	2	12	18	1[a]	s.	J. E. Watts.
Carmona	Polk	.....	1	84.6	.....	103	14	64	20	35	5.54	.....	5.38	0.0	4	16	15	0	s.	G. S. Warner.
Claytonville	Fisher	2,100	5	82.0	.....	102	9	62	22	30	1.95	.....	0.94	0.0	4	12	6	13	e.	Wm. Lanius.
Coleman	Coleman	1,710	15	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	J. H. Tucker.
Colorado	Mitchell	2,066	15	84.4[a]	+ 1.1	105	10†	66[a]	23	35[a]	2.75	− 0.58	0.60	0.0	8	19[a]	5[a]	6[a]	s.	R. M. Webb.
Columbia	Brazoria	34	20	83.8	+ 1.8	101	16	70	9†	31	6.25‖	+ 2.15	5.00‖	0.0	3	20	9	2	s.	R. B. Loggins.
Columbus§§	Colorado	206	5	.....	.....	.....	.....	.....	.....	.....	5.02	.....	2.00	0.0	9	13	12	6	s.	Mrs. Sophie Bridge.
Comstock	Valverde	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	A. D. Brown.
Corpus Christi	Nueces	20	22	83.5	+ 0.8	92	21	75	31	15	0.37	− 1.29	0.29	0.0	4	18	11	2	se.	U. S. Weather Bureau.
Corsicana§§	Navarro	445	20	88.2	+ 4.5	105	11	72	20	29	0.61	− 2.45	0.45	0.0	3	26	2	3	se.	E. L. Gibson.
Crockett	Houston	350	5	86.8	.....	105	13†	70	20	32	0.88	.....	0.38	0.0	7	12	17	2	s.	A. M. Rencher.
Cuero§§	DeWitt	177	20	86.2	+ 1.2	104	16†	69	18	32	4.31	+ 1.66	1.85	0.0	7	28	1	2	s.	H. R. Frobese.
Dallas§§	Dallas	466	20	87.6	+ 4.6	106	31	70	20†	31	T.	− 3.59	T.	0.0	0	22	0	9	s.	G. A. Eisenlohr.
Danevang	Wharton	145	13	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	H. P. Hermansen.
Decatur	Wise	1,047	3	84.7[a]	.....	107[a]	28†	67[a]	23	34[a]	0.22	.....	0.22	0.0	1	25[a]	2[a]	3[a]	.....	Agent Ft. W. & D. C. Ry.
Del Rio	Valverde	952	3	85.0	+ 0.3	105	21	70	20	33	5.70	+ 3.48	3.53	0.0	5	18	9	4	se.	U. S. Weather Bureau.
Dialville	Cherokee	575	11	86.0	+ 5.1	102	13†	68	20	31	0.63	− 4.75	0.30	0.0	4	21	9	1	s.	J. V. McKnight.
Dublin§§	Erath	1,466	14	84.8	+ 3.5	102	11†	70	22	28	1.10	− 1.76	0.40	0.0	5	18	12	1	s.	Jno. O. Shafer.
Duval	Travis	820	20	85.0	− 0.9	100	15†	70	22	25	2.79	+ 0.05	2.15	0.0	2	15	14	2	s.	J. C. Edgar.
Eagle Pass	Maverick	800	20	90.3	+ 4.2	107	22	74	31	30	1.35	− 0.43	0.75	0.0	2	7	22	2	se.	Jos. Metcalfe.
Edna	Jackson	.....	.....	.....	.....	.....	.....	.....	.....	.....	6.76	.....	3.00	0.0	7	7	13	11	s.	E. L. Faires.
El Paso	El Paso	3,762	30	81.8	+ 1.3	105	12	66	24	27	1.62	− 0.51	0.95	0.0	9	12	17	2	e.	U. S. Weather Bureau.
Encinal	La Salle	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	H. C. Braden.
Fairland	Burnet	.....	.....	86.8	.....	108	16†	61	30†	38	1.07	.....	1.07	0.0	1	1	20	10	s.	R. L. Bush.
Falfurrias	Starr	.....	2	86.4	.....	102	11†	68	17†	30	2.43	.....	2.08	0.0	3	26	4	1	se.	W. A. Gardner.
Flatonia	Fayette	465	1	85.0	.....	103	16†	71	18†	30	6.14	.....	5.30	0.0	5	12	16	3	s.	Julius Laux.
Fort Clark §§	Kinney	1,050	22	85.6	+ 0.6	103[a]	14	70	19†	29	3.05	+ 1.12	2.00	0.0	5	19	8	4	e.	Post Surgeon.
Fort McIntosh	Webb	460	23	91.2	+ 3.8	106	10†	75	1	26	1.61	− 0.33	0.80	0.0	4	24	0	7	e.	Do.
Fort Stockton	Pecos	3,050	4	81.6	.....	110	11	64	3	37	5.21	.....	3.18	0.0	5	4	26	1	se.	H. H. Butz.
Fort Worth	Tarrant	670	14	87.4	+ 4.5	104	11	72	21	26	0.02	− 3.02	0.02	0.0	1	22	9	0	s.	U. S. Weather Bureau.
Fredericksburg	Gillespie	1,742	20	83.2[a]	+ 1.7	102[a]	9	68[a]	22	31[a]	6.71	+ 4.56	6.15	0.0	2	26	4	1	s.	Arthur Striegler.
Gainesville	Cooke	738	20	88.0	+ 6.0	106	9†	70	26†	31	0.72	− 3.83	0.60	0.0	2	.....	.....	.....	.....	J. L. Hickson.
Galveston	Galveston	69	39	84.0	+ 1.0	91	20	72	21	12	0.61	− 3.37	0.50	0.0	3	15	13	3	se.	U. S. Weather Bureau.
Gatesville	Coryell	795	5	86.5	.....	104	16	70	1†	28	0.50	.....	0.50	0.0	1	24	7	0	.....	John Ryan.
Georgetown§§	Williamson	750	14	86.4	+ 2.3	106	16	70	1†	32	0.65	− 3.02	0.58	0.0	3	26	4	1	s.	Prof. R. E. Young.
Gonzales§§	Gonzales	299	4	.....	.....	.....	.....	.....	.....	.....	4.19	.....	3.66	0.0	4	16	10	5	s.	J. M. Johnson.
Graham	Young	1,040	5	88.6	.....	109	10†	66	27	35	2.85	.....	1.32	0.0	4	.....	.....	.....	.....	C. W. Johnson.
Grandfalls	Ward	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	W. C. Bridwell.
Grapevine	Tarrant	670	19	88.2	+ 5.0	106	11	71	3†	29	0.77	− 2.82	0.70	0.0	2	15	16	0	s.	W. J. Crowley.
Greenville§§	Hunt	550	9	88.3	.....	107	10†	69	21	30	1.35	.....	0.70	0.0	4	16	0	15	s.	J. P. Regan.
Hallettsville	Lavaca	235	18	86.1	+ 2.1	103	15	73	17†	27	8.90	+ 6.23	8.50	0.0	4	18	8	5	s.	Dr. J. E. Lay.
Haskell	Haskell	4,013	18	88.3	+ 3.6	109	11	70	23†	37	1.25	− 0.04	0.61	0.0	3	7	20	4	s.	P. D. Saunders.
Hebbronville	Duval	.....	2	.....	.....	.....	.....	.....	.....	.....	3.22	.....	3.22	0.0	0	1	.....	.....	.....	Henry Edds.
Hempstead§§	Waller	254	5	.....	.....	.....	.....	.....	.....	.....	1.39	.....	0.99	0.0	2	19	4	8	s.	J. H. Hancock.
Henderson	Rusk	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.08	.....	0.05	0.0	2	18	8	5	.....	M. Kangerga.
Hewitt	McLennan	664	14	.....	.....	.....	.....	.....	.....	.....	0.59	− 3.14	0.35	0.0	3	.....	.....	.....	.....	I. H. Earle.
Hillsboro	Hill	628	17	87.8	.....	103	11	70	24	31	0.23	− 2.87	0.23	0.0	1	.....	.....	.....	.....	Thompson & Campbell.
Hondo	Medina	901	7	89.6	.....	103	11†	73	20†	24	2.71	.....	1.83	0.0	2	18[a]	11[a]	1[a]	.....	H. E. Haas.
Houston§§	Harris	53	20	85.3	+ 2.3	103	16	73	18†	29	2.53	− 1.31	0.80	0.0	7	24	0	7	s.	O. O. Ballard.
Hubbard	Hill	638	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	J. C. Mecklin.
Huntsville§§	Walker	400	21	84.7	+ 1.3	99	13†	70	20	25	1.38	− 2.24	0.63	0.0	4	26	0	5	se.	W. Y. Barr.
Jewett§§	Leon	496	5	87.1	.....	109	15	68	22	36	2.79	.....	1.61	0.0	6	13	10	8	s.	Earle Adkisson.
Junction	Kimble	1,645	7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	J. T. Rowsey.
Kaufman	Kaufman	448	10	88.5	+ 4.5	104	11	70	20	29	0.25	− 5.49	0.25	0.0	1	24	7	0	s.	B. J. Hubbard.
Keene	Johnson	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Industrial Academy.
Kerrville§§	Kerr	1,650	14	82.5	+ 1.7	102	16	65	20	35	9.81	+ 6.41	8.20	0.0	5	5	13	13	s.	Mrs. F. Coleman.
Knickerbocker	Tom Green	2,050	5	84.1	.....	104	10†	66	18	32	3.19	.....	1.76	0.0	5	22	5	4	s.	Jos. Tweedy.
Kopperl	Bosque	576	9	.....	.....	.....	.....	.....	.....	.....	1.50	.....	1.50	0.0	1	17	11	3	s.	T. A. Johnson.
Lampasas§§	Lampasas	1,026	18	86.3	+ 3.7	105	9†	69	22	32	0.69	− 1.22	0.36	0.0	2	27	3	1	s.	Mrs. K. I. Webber.
La Parra	Cameron	38	7	.....	.....	.....	.....	.....	.....	.....	1.60	.....	1.00	0.0	2	.....	.....	.....	.....	Jno. G. Kennedy.
Laureles Ranch	Nueces	20	10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Matt Cody.
Liberty§§	Liberty	38	5	83.1	.....	101	15	70	13†	29	5.17	.....	1.32	0.0	11	20	6	5	s.	Mrs. Fannie Sneed.
Llano	Llano	1,040	18	87.6	+ 2.8	106	10	68	22	29	1.03	− 0.93	1.00	0.0	2	29	1	1	se.	E. W. Torrence.
Llano Grande	Hidalgo	.....	1	83.2	.....	102	21	64	1†	34	0.11	.....	0.10	0.0	2	29	0	2	se.	M. D.Wardlaw.
Long Lake§§	Anderson	.....	4	.....	.....	.....	.....	.....	.....	.....	0.76	.....	0.50	0.0	3	.....	.....	.....	e.	Geo. Ellis
Longview§§	Gregg	336	20	87.2	+ 2.9	106	9	72	24†	29	1.45	− 2.38	0.63	0.0	6	19	1	11	se.	C. A. Propst.
Lufkin	Angelina	325	2	84.2	.....	100	13†	70	20†	28	3.68	.....	1.11	0.0	6	16	11	4	s.	T. A. King.
Luling§§	Caldwell	418	20	86.4	+ 1.8	103	15	71	22	26	4.96	+ 2.28	4.80	0.0	3	17	8	6	s.	John Carter.
Marble Falls§§	Burnet	771	1	.....	.....	.....	.....	.....	.....	.....	2.09	.....	1.00	0.0	5	11	14	6	sw.	Wm. Harrison.
Marfa	Presidio	.....	1	.....	.....	.....	.....	.....	.....	.....	3.10	.....	1.70	0.0	5	.....	.....	.....	.....	R. K. Colquitt.
Marshall	Harrison	375	.....	85.5	.....	102	9†	69	24†	27	1.56	.....	0.61	0.0	6	2	25	4	s.	Lee Scott.
Mexia§§	Limestone	537	5	85.9	.....	103	15	70	19†	30	0.23	.....	0.10	0.0	3	10	14	7	w.	Miss Josephine Newman.
Midland	Midland	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.25	.....	1.00	0.0	2	18	10	3	.....	H. J. Elder.
Mt. Blanco	Crosby	2,750	21	82.0	+ 3.0	103	11	58	18	37	1.69	− 1.61	0.96	0.0	3	11	3	17	s.	H. C. Smith.
Nacogdoches§§	Nacogdoches	271	10	83.6	+ 1.4	98	13†	69	20	26	4.33	− 1.08	4.00	0.0	3	18	10	3	s.	Miss Mary Hofmann.
New Braunfels	Comal	720	20	85.7	.....	100	3†	69	22	25	3.77	+ 1.01	3.77	0.0	1	11	19	1	e.	J. Giesecke.
Palestine	Anderson	510	27	84.4	+ 2.9	99	15	72	20	24	0.80	− 2.20	0.52	0.0	4	7	16	8	s.	U. S. Weather Bureau.

TABLE 1.—*Climatological data for July, 1909. District No. 8*—Continued.

Stations.	Counties.	Elevation, feet.	Length of record, yrs.	Temperature, in degrees Fahrenheit.							Precipitation, in inches.				Number of rainy days, .01 inch or more.	Sky.			Prevailing wind direction.	Observers.
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall unmelted.		Number of clear days.	Number of partly cloudy days.	Number of cloudy days.		
Texas—Cont'd.																				
Panter	Hood	1,000	19																	E. H. Snider.
Pierce	Wharton		3	80.7		96	17	68	2†	27	5.66		3.83	0.0	8	12	18	1		R. B. Pointer.
Plainview	Hale	3,370	1	78.8		101	11	59	23	34	3.37		1.45	0.0	4	14	15	2	se.	J. F. Sander.
Port Lavaca	Calhoun	20	8	84.4		96	16†	73	17†	23	5.32		3.78	0.0	3	23	6	2	se.	J. H. Bickford.
Ricardo	Nueces			86.1		101	16†	71	17†	29	0.23		0.23	0.0	1	19	12	0	s.	Lindsay Waters.
Riverside§§	Walker	169	5								1.10		0.70	0.0	2	22	0	9	s.	Mrs. C. W. Higdon.
Robert Lee§§	Coke	1,850	1	84.4		105	11	67	18	29	1.73		0.61	0.0	6	25	4	2	se.	H. D. Pearce.
Rockland§§	Tyler	136	5								2.53		0.96	0.0	4	17	5	9	s.	D. W. Bellamy.
Rossville	Atascosa	558	2	87.8		106	11†	71	22	32	3.72		2.45	0.0	6	5	26	0	se.	W. F. M. Ross.
Runge	Karnes	308	14								1.52	− 1.96	0.63	0.0	3					Reiffert & Frobese.
Sabinal	Uvalde	964	5	87.2		103	9†	71	20†	30	1.40		1.08	0.0	3	7	12	12	e.	Jas. Johnston.
San Angelo	Tom Green		1																	C. W. Goff.
San Antonio	Bexar	701	24	85.8	+ 3.4	102	3	70	22	27	3.27	+ 1.05	2.89	0.0	5	15	15	1	se.	U. S. Weather Bureau.
San Augustine	San Augustine			85.4		102	14	69	20	28	1.85		0.72	0.0	8	14	10	7		F. A. Wilson.
San Juanita§	Hidalgo			88.7[b]		105	21	71[d]	31	30[d]	0.02		0.02	0.0	1	3	24	4	se.	J. B. McAllen.
San Marcos§§	Hayes	588	16	85.4	+ 1.9	101	15	70	22	25	3.45	− 0.45	3.00	0.0	2	20	0	11	s.	Miss L. C. Ford.
San Saba	San Saba	1,712	5	84.8		103	9†	66	18	33	0.36		0.20	0.0	3	27	3	1	s.	Jas. Burns.
Santa Gertrudes	Nueces		7																	J. B. Wright, jr.
Seymour	Baylor	1,180	3	85.6		104	11†	69	17†	30	0.67		0.22	0.0	7	20	11	0	s.	F. M. Deaver.
Somerville	Burleson	251						72	28		0.08		0.08	0.0	1	24	0	7	e.	W. A. Dolan.
Sonora	Sutton	2,200	6	81.6		101	16	65	1†	34	4.46		1.85	0.0	6	6	20	5	s.	Mike Murphy.
Sugarland	Fort Bend	79	11	84.2	+ 1.7	100	14†	71	19	27	2.63	− 2.80	0.92	0.0	6	18	11	2	s.	O. M. Bakke.
Taylor	Williamson	583	8	85.4	+ 2.7	101	15	67	22	26	1.23	− 1.39	0.20	0.0	4	23	7	1	s.	U. S. Weather Bureau.
Temple	Bell	630	15	86.7	+ 3.7	104	16†	70	19	29	0.77	− 2.32	0.48	0.0	4	26	4	1	s.	W. B. Tyer.
Tilden‖	McMullen		3	89.0		108	11	70	20	33	1.05		0.57	0.0	3	6	12	3	se.	Wm. Kuykendall.
Uvalde	Uvalde	937	1	86.4		103	15†	70	7†	30	3.54		1.42	0.0	5	21	0	10	se.	F. M. Getzendaner.
Valley Junction§§	Robertson	289	4																	T. M. Williams.
Victoria§§	Victoria	187	11	85.9	+ 1.7	97	16†	72	19†	23	5.22	+ 1.27	2.15	0.0	5					C. C. Zirjacks.
Waco§§	McLennan	424	20	89.6	+ 4.2	105	15	75	3	26	0.46	− 2.17	0.25	0.0	2	25	2	4	s.	E. H. Hall.
Waxahachie§§	Ellis	556	13	87.4	+ 3.8	107	8	67	21	31	2.63	− 0.40	1.35	0.0	5	22	5	4	e.	C. D. Longserre.
Weatherford§§	Parker	864	20	88.1	+ 4.5	106	11	72	3	28	T.	− 3.09	T.	0.0	0	27	1	3	n.	Miss J. Stickfort.
Wharton§§	Wharton	105	7	83.2[a]		97[a]	10†	66[a]	23	29[a]	4.79		3.17	0.0	7	19[a]	5[a]	6[a]	s.	Mrs. F. M. Hughs.
Wills Point	Van Zandt	524	4								0.40		0.40	0.0	1					W. W. Gibbard.
Zapata	Zapata			89.4		106	5†	71	20	33	1.01		0.93	0.0	2	14	16	1	se.	F. H. Earnest.

• Temperature extremes are from observed readings of the dry-bulb; means are computed from observed readings.
•• Precipitation included in that of the next measurement.
† Also on other dates.
§ Data are from standard instruments not supplied by the U. S. Weather Bureau.
§§ Instruments are read in the morning; the maximum temperature then read is charged to the preceding day, on which it almost always occurs.
‖ Estimated by observer.
‖‖ Precipitation for the 24 hours ending on the morning when it is measured.
T. Precipitation is less than 0.01 inch rain or melted snow.
[a], [b], [c], etc., indicate, respectively, 1, 2, 3, etc., days missing from the record.

TABLE 2.—*Daily precipitation for July, 1909. District No. 8, Texas and Rio Grande Valley.*

Stations.	River basins.	Day of month.																													Total.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Colorado																																	
Amethyst (near)	Rio Grande																																
Blanca	Trinchera			T.	.26										T.	.01	T.			T.	T.	T.	T.	.14	.11	T.	T.				T.	.18	0.70
Cumbres	Conejos																																
Garnett	Rio Grande					.50										T.			T.	T.	T.	.25	.10	.05	.05								0.95
Hermit	...do																																
La Veta Pass	Trinchera				.10	.12	.80								T.	.36							.19					T.			T.	T.	1.57
Manassa	Conejos																																
Platoro	...do																																
Saguache	San Luis																																
San Luis	Culebra			.26	.32	.03				.01					.18	.03						.07	.05	.10	.15	.05	.01					.55	1.81
Wagon Wheel Gap	Rio Grande																																
New Mexico																																	
Agricultural College	Rio Grande	T.		.48												T.	.01				.04			.09		.01					.08	0.71
Alamogordo (near)	...do	.14	T.											T.										.48								0.62
Alamogordo (2)	...do	.40															.13	.05							.64							1.22
Albuquerque	...do																		.07				.25	.03	.33	.12	.05						
Amizett	...do			T.	T.	.16			T.					.04	.03	T.	.09		.03	T.	.08	.02	.08	.13	.80	.01	T.				.03	.28	1.78
Ancho	...do			1.00	.50	.50	.50														.50											3.00
Aspen Grove Ranch	...do																			.65		.52								.30		.22	
Bateman's Ranch	...do																																
Bluewater	...do				.37	.10											.25				.24			.47		.05					.15	1.63
Bluewater Reservoir	...do				1.00	T.										T.			.40				.35				T.			T.		1.75
Boas	Pecos																	.17						.20	.30	.08				.82			1.57
Capitan	...do	.50			.20	.20	.16								.04		.23				.12		.10	.20	.44	.02					.03	.03	2.27
Carlsbad	...do	.11				.11			.05							.36		.04						1.09	.84		1.06						3.66
Carrizoso (1)	Rio Grande	.05	.06	.02			.06		T.						.04	.38				T.				.46		.30	.20			1.01			2.58
Carrizoso (2)	...do	.50		.09		.02	.09									.43	.25							.54	.30	.32				1.09			3.68
Chama	...do			.13	.08		.36														.25	.70	.10	T.	.51	T.						.20	2.33
Cloudcroft (1)	Pecos																																
Cloudcroft (2)	...do	.25	.20	.23	.63	.21	.23	.19	.03	.02						T.					1.2			.65	.53					.32	T.		4.69
Corona	...do			T.	T.	T.	.01	T.	1.00						T.	.40							.85	T.							.67		2.93
Coyote	Rio Grande	.12						.05	.02					.17		.55								T.		.19							1.10
Cundiyo	...do			.06												.06		.06						.20		.12	.04					.26	0.80
Demonstration Farm	Pecos				.46	.05	.60							.32		.07										1.04						.18	2.72
Duran (1)	...do	.10			.03		.10	.01								.10								.10		.05				.15		0.64
Duran (2)	...do																																
Edison Mine	Rio Grande																																
Elk (near)	Pecos	T.	.33				.18				.41									.05			.05	.73	2.87	.41	.31			T.	T.		5.84
Escondido	Rio Grande						.16		.27								T.			.44			T.		.31	T.	.09			.15			1.42
Espanola	...do			.07		.04	T.						T.			T.								.37								0.48
Estancia	...do			.01	.11			T.		.09			.09				.22		T.		.13			.05		.02			.27		T.	0.99
Fort Stanton	Pecos	.30			T.	.10	.70	.70							T.	T.	.28				T.	T.		.50	.48	.07	.04			.01	.10		3.28
Fort Sumner	...do	.48	.08	T.			T.									T.	.05		T.				T.	.08	.28	.03			T.	.06	T.	1.06
Gallinas	...do						.41		.12					.03	.10	.10						.10		.58	.20	.06				.06			1.76
Gallinas Planting Stat.	...do	.14			1.00		.76			T.	T.			.46	.13	.18	.28				.31	T.	1.40	.02		.37					.01	.05	5.11
Harvey's Upper Ranch	...do	.04		T.	.48	.25	1.00			T.			T.	.10	.52	.08	T.			T.	.09	T.	1.47	.12	.98	.13					.09	.06	5.41
Hillsboro	Rio Grande	T.			T.		T.								.16		.24	.30		.08	T.	.27		.11					.10			1.26
Hodges	...do				T.			T.					T.				T.		T.		T.				.87	.63	.37				.13	.63	2.63
Hondo Reservoir	Pecos		.85				.03																	.37	1.07	.25	.05						2.62
Hope	...do																																
Hopewell	Rio Grande		T.		T.					T.						.01	.01	.05	T.	.02	.16	.04	.19	.03	.29	T.				.03	T.	0.83
Laguna	...do			.10		.50								T.	T.						T.	T.	T.		.50	.35						1.45
Lagunita	Pecos	.14							.38							.03									.04					.06			0.65
La Huerta	...do	.05					.16			.09							.15							.30	1.62	1.15	.15						3.67
Lake Valley	Rio Grande	T.			T.	T.	T.							.28		.21	.25	.05	.08	.03	.01	.01	.07	.14		.05				.24			1.40
Las Vegas	Pecos	.11		.04		.42	.02	T.						.35		.05	.04				.09	T.	.01	.06		.34					T.	T.	1.53
Los Lunas	Rio Grande				T.		T.																T.	T.	T.							T.	
Los Tanos	Pecos	.60			.25										.52	.15	.10															.02	1.95
Magdalena	Rio Grande					.16									.50	.35		.38	.80				.15	.90		T.				.34		T.	3.58
Mineral Hill	Pecos				.22									1.13	.40		.16						1.10			.06					.50	T.	3.57
Monument	...do																																
Mountainair	Rio Grande			.10	.12	.12	T.	.04	T.				.27		.30	T.			T.	T.	T.	T.	T.			.44	.52				.40		2.31
Newman	...do		T.		.01	T.																			.15	.58	T.						0.74
Noria	...do				.04	.20																.04	.50	.80		.03							1.61
Orogrande	...do	T.	T.				.06		.02													T.		T.	.06	.01	.02						0.17
Oscura (near)	...do								.14	.08				.11		.40	.80			.08				.12	.12	.04	.18					.04	2.11
Oscura (2)	...do		.01						.09	.14				.04		.14	.99			.06	.04	.01		.09	.07	.04	.16					.06	1.94
Otis	Pecos	T.				T.	T.		.01								.05	T.						.22	1.13	1.14	.66						3.21
Otto	Rio Grande		T.	.20	.05	.25			.02					.27	T.	.01					.07					.01					.39		1.27
Pastura	Pecos						.14	.14							.06																		0.34
Red River	Rio Grande																																
Rincon	...do					.33		T.						T.		T.		.42														.52	1.27
Rio Grande Dam	...do	T.		.11	.99	.02	.05		T.					.15			.33		.08	.40	.19	.07	T.	.07		T.	T.		T.	.09	T.	.15	2.70
Rosedale	...do		T.		.14	.10	.15		.06		T.			.01		.07				.01		.07	.59	.13		.03	.04					.58	1.48
Roswell	Pecos		.23			.18	.05									.01				T.				.15	1.00	.32	T.						1.94
San Marcial	Rio Grande																																
San Rafael	...do				.34	.07									T.	.35							.14		1.38	.06		.30					2.64
Santa Fe	...do	.05	T.	T.	.20	.08	.02							.37	.01	.01	.08	.13		.05	.51	.26	T.	.04	.01	.53					T.	.04	2.39
Santa Rosa (1)	Pecos	.34		.12	T.	T.	.13	.01		.69				.09	.47	.43		.05					.02	T.		.24	.56				.75	T.	3.90
Santa Rosa (2)	...do	.35		.20			.10			.20				.10	.68								.10					.80				2.53
Socorro	Rio Grande					.26	.07								.20	.10						.31			.28		.20			.31		1.73
Stanley	...do				.05	.75								.05		.05										.55					T.		1.45
Strauss	...do				.10	.10	T.									.05					.10											0.35
Taos	...do																																
Taos Canyon	...do														.03	.12				T.	.02	.21	.05	.37	.06	.35					.49	.16	
Tecolote	...do	.01		T.	T.	T.	.01	.08		.25				T.	1.70	T.	.42				.04		.08	.51	.23		.02						3.35
Three Rivers	...do								.25	.01						.30	.07	.05	.05				.02		.17	.05	.35						1.32
Torrance	Pecos				.30	1.20	.10		.70						.50	.09							T.	.10		.15							3.14
Tres Piedras	Rio Grande				.65	.20										T.					.20		.60	T.								1.75
Truchas	...do				.30																			T.						.20	.35	0.95
Tularosa (1)	...do	.35			.03											.21	.26	T.	.09		.04		T.		.84		T.						1.85
Tularosa (2)	...do	.01	T.													.03		.01	T.						.75								0.80
Vaughn	Pecos	.22		.07	.01		.33										1.30						.11	.02	.05	.31					.22		2.54
Winsors	...do		.84	.20		.33	.29		.18							.16			.24				.51	.40	.35	.40						1.26	5.16
Texas																																	
Abilene	Brazos	.17	.17		.19											.32					.22						.02						1.09
Albany	...do															1.53	.08	.04					.08				.10						1.83
Alvin‖	Coast				T.		1.89												.47				.58		.29						.66		3.89
Anahuas	...do			1.73														1.41	.31	.39		.41	.08										4.33
Austin	Colorado					.06													.05		3.62	.09								.04			2.86
Ballinger‖	...do			T.															T.		.27			1.55								1.32
Barstow	Pecos	.55																					T.	1.80	1.13	.58	.44						4.50
Beaumont	Neches																.21	.07	1.18	.18	.06	.68	.06	.08									2.54
Beeville‖	Coast		1.62	.95															.06		.04		1.50										4.17
Big Springs	Colorado	.13	T.	T.				.03			T.						.02						T.	.33		.02	.10		.02				0.65

TABLE 2.—*Daily precipitation for July, 1909. District No. 8*—Continued.

Stations.	River basins.	Day of month.																													Total.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Texas—Cont'd.																																	
Blanco‖	Guadalupe																		.28				3.60	.76									4.64
Boerne	San Antonio																T.	T.	T.				6.50	.40									6.90
Booth‖	Brazos						.43												.35				1.29	.19					.38		.10	.10	2.84
Boquillas	Rio Grande																																
Bowie	Trinity	.46	.19				T.													T.				.04				.16				T.	0.85
Brazoria	Brazos	.03		.03	.09	.17												.16	.05			5.00	.03	2.05								
Brazos	...do																		1.00	1.02				.14									2.16
Brenham‖	...do				.03		.01	T.											T.	.20			1.30	.19						T.			1.73
Bridgeport‖	Trinity																.11											12					0.23
Brighton	Coast					.05																											0.05
Brownsville	Rio Grande	1.25		.19																.09										T.	.07		1.60
Brownwood	Colorado		.14	.02	.11													T.	T.			T.	.10	.10								0.47
Cameron‖	Brazos																			.01		.02											0.03
Carmona	Neches		.01	T.	T.	.12													T.	.03		T.		5.38					T.	T.	T.		5.54
Claytonville	Brazos	.21	.50						.30							.04																	1.95
Coleman	Colorado																																
Colorado	...do		.54			.58					.13	.12					.43							.18	.03		.14		.60				2.75
Columbia	Brazos			.10														1.15				5.00	T.	T.	T.	T.	T.			T.			
Columbus‖	Colorado				.32	.42	.50												1.30	.12			2.00	.06	.16						.14		5.02
Comstock	Rio Grande																																
Corpus Christi	Coast				.02	.06			T.										T.				.07	.22									0.37
Corsicana	Trinity	.13																						.45	.03								0.61
Crockett	...do		T.		.07	.14												T.	.62	.04		.02	T.		.21						.38		0.88
Cuero‖	Guadalupe	.09			.42														1.24	.61			1.75	.08	.12								4.31
Dallas‖	Trinity			T.																													T.
Danevang	Coast																																
Decatur	Trinity																		T.				.22	T.									0.22
Del Rio	Rio Grande	.75					1.53	.07															2.53	.82									5.70
Dialville	Neches	T.	.10				T.												.03				.20	T.	.30								0.63
Dublin‖	Brazos				.17														.40	.10			.35	.08									1.10
Duval	Colorado			.64			T.												T.	T.		T.	2.15							T.			2.79
Eagle Pass	Rio Grande	.60				.75																											1.35
Edna	Lavaca			T.	1.10	.60		T.						T.					.68	.08	T.	3.00	.30	T.	1.00	T.		T.	T.	T.			6.76
El Paso	Rio Grande	.03	.04	.09	.07	.95										.04			.01				T.	T.	.18	.21	T.						1.62
Encinal	Nueces																																
Fairland	Colorado			T.														T.					1.07										1.07
Falfurrias	Coast	2.08																		.17										.18			2.43
Flatonia	Guadalupe					T.	T.											.05	.74			.30	5.00	T.	.05								6.14
Fort Clark‖	Rio Grande		.18			.07	.10	.70																2.00										3.05
Fort McIntosh	...do	.47					.26														.80	.08											1.61
Fort Stockton	Pecos	.50						.17										T.					T.	3.18	.10	1.26	T.		T.				5.21
Fort Worth	Trinity		T.																T.				.02					T.					0.02
Fredericksburg	*Colorado*																	.56			T.		6.15										6.71
Gainesville	Trinity		.60																				.12										0.72
Galveston	Coast			T.		T.												.08	T.			.50					T.				.03	T.	0.61
Gatesville	Brazos														.50																		0.50
Georgetown	...do																			.02			.58	.05									0.65
Gonzales‖	Guadalupe				.26															.17		3.66	.10										4.19
Graham	Brazos	.53															.10	.90										1.32					2.85
Grandfallo	Pecos																																
Grapevine	Trinity	.07	.70																	T.													0.77
Greenville‖	Sabine	.35																.20		.70	.10												1.35
Hallettsville	Lavaca		.10		.15												T.	T.				T.	8.50	T.	T.					.15			8.90
Haskell	Brazos	.40																						.24					.61				1.25
Hebbronville	Coast	3.22																															3.22
Hempstead‖	Brazos																						.40	.99	T.		T.						1.39
Henderson	Neches		.03																T.	.05		T.	T.										0.08
Hewitt	Brazos		.20				.04										T.		T.				.35										0.59
Hillsboro	...do	.23																															0.23
Hondo	Nueces	T.																		.88			1.83										2.71
Houston‖	Coast				.30		.23												.80	.05			.40	.70				.05		T.			2.53
Hubbard	Trinity																																
Huntsville‖	...do						.35												.30	T.			.63	.10									1.38
Jewett‖	...do	.10	.21															T.		.50		.32	T.		1.61	.05							2.79
Junction	Colorado																																
Kaufman	Trinity	T.																	.25														0.25
Keene	Brazos																																
Kerrville‖	Guadalupe					.45													.27				.64	8.20	.25								9.81
Knickerbocker	Colorado	.06			T.			.14									T.	.48			T.		.75	1.76									3.19
Kopperl	Brazo	1.50																															1.50
Lampasas‖	...do																						.33	.36									0.69
La Parra	Coast	1.00	.60																														1.60
Laureles Ranch	...do																																
Liberty‖	Trinity				.16	.65	.16	T.											.73	.43		1.08	T.	.26	1.32	T.	.14	.20	.04	T.	T.		5.17
Llano	Colorado																						1.00	.03						T.			1.03
Llano Grande	Rio Grande																		.01												.10		0.11
Long Lake‖	Trinity			.40																	.16						.50						0.76
Longview‖	Sabine	.16			.07																		41	.14	.63		.04						1.45
Lufkin	Neches				.08	1.07												.20	.32			T.	.90		1.11								3.68
Luling‖	Guadalupe				.08																		4.80	.08									4.96
Marble Fall‖	Colorado				.06														1.00	.10			.75	.18									2.09
Marfa	Rio Grande												.40							.30				.50	1.70		.20						3.10
Marshall	Sabine		.40				T.												.01			.01	.61	.51						.02		1.56
Mexia‖	Brazos		.08																				.05	.10									0.23
Midland	Colorado																							1.00		.25							1.25
Mount Blanco	Brazos							T.		.57							.16	T.									.96						1.69
Nacogdoches‖	Neches	T.																	.26				T.	.07	4.00								4.33
New Braunfels‖	Guadalupe																		T.				3.77										3.77
Palestine	Trinity	T.				.01												.52		.01		T.	T.		.26								0.80
Panter	Brazos																																
Pierce	Colorado				41	.06													.11	.42		3.83	.18		.44					.21			5.66
Plainview	Brazos			34					.23															1.45		T.	1.35							3.37
Port Lavaca	Coast	.42	T.		T.	T.													1.12			3.78		T.	T.				T.				5.32
Ricardo	...do	.23																												T.	T.		0.23
Riverside‖	Trinity																		T.				T.	.70	.40								1.10
Robert Lee‖	Colorado						.02										.01	.24					.42	.61					.43				1.73
Rockland‖	Neches						.25																.54	.96		.78							2.53
Rossville	Nueces	.08				.03													.51	.60	.05	T.	2.45										3.72
Runge	San Antonio	.50																		.33		.63											1.52
Sabinal	Nueces							.05												.27			1.08										1.40
San Angelo	Colorado																																
San Augustine	Neches	.10	.10	T.			.05											.72	.62			.03	.08		.15		T.				T.		1.85
San Antonio	San Antonio	.26			T.														.09	.03		.07	2.82										3.27
San Juanita	Coast	.02																		T.														0.02
San Marcos‖	Guadalupe																			.45		3.00												3.45

TABLE 2.—*Daily precipitation for July, 1909. District No. 8*—Continued.

Stations.	River basins.	Day of month.																													Total.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Texas—Cont'd.																															
San Saba	Colorado																	.02					.14	.20									0.36
Santa Gertrudes	Coast																																
Seymour	Brazos	.22	.02													.10	.13	.06					T.	.04	T.		T.	.10					0.67
Somerville	do																			T.		.08		T.									0.08
Sonora	Rio Grande	.27	.49					1.12										.08					.65	1.85									4.46
Sugarland	Brazos			T.		.92												.52				.86	.08			.03			.22		T.		2.63
Taylor	do			.02			T.											.01				1.11	1.09	T.		T.							1.23
Temple	Brazos			.21															.08				.40	.08									0.77
Tilden	Nueces	.38																		.57			.10										1.05
Uvalde	do	.08					1.42	.48												.97			.59							T.			3.54
Valley Junction	Brazos																																
Victoria	Guadalupe	1.28	.05		.27		.70													2.05			2.15										6.50
Waco	Brazos																					.21	T.		.25								0.46
Waxahachie	Trinity	.12		.08														T.	.33	.75					1.35								2.63
Weatherford	do																T.	T.						T.									T.
Wharton	Colorado																		.07		.15		3.17	T.			.30	.31	.08			.71	4.79
Wills Point	Sabine																		T.	T.	.40												0.40
Lapata	Rio Grande	.93																			.08												1.01

TABLE 3.—*Maximum and minimum temperatures at selected stations July, 1909. District No. 8, Texas and Rio Grande Valley.*

Date	Colorado.				New Mexico.																Texas.							
	Garnett.		San Luis.		Agricultural College.		Carlsbad.		Fort Stanton.		Mountainair.		Roosdale.		Roswell.		Santa Fe.		Santa Rosa.		Abilene.		Big Springs.		Brownsville.		Corpus Christi.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1...	85	44	83	50	90	64	89	67	77	48	82	55	82	59	85	64	81	58	81	58	89	69	89	69	87	72	84	79
2...	88	43	82	48	91	74	89	67	80	55	86	55	80	55	87	67	78	53	88	64	91	72	95	69	92	76	86	81
3...	85	44	84	47	94	71	94	67	84	52	90	58	82	57	91	67	81	56	94	63	95	72	98	68	93	76	90	77
4...	87	45	79	49	90	68	97	65	84	57	94	55	80	56	94	66	81	59	94	65	95	76	101	76	92	76	92	79
5...	80	43	78	53	92	69	97	71	83	56	90	59	73	59	94	68	81	58	90	64	95	75	101	75	90	79	86	77
6...	84	44	82	54	90	62	100	68	84	55	84	59	77	59	95	71	78	59	91	69	95	76	98	74	91	80	87	83
7...	84	42	80	51	98	69	99	68	88	58	91	61	88	56	91	68	86	56	97	64	93	75	92	73	92	78	87	81
8...	88	43	83	44	97	67	99	70	86	58	94	54	90	68	93	69	87	60	96	64	97	75	101	74	91	80	89	80
9...	87	43	85	42	99	68	103	73	87	58	91	54	89	58	95	66	86	57	99	68	100	76	106	75	93	76	90	76
10...	87	42	81	41	102	72	108	70	94	56	94	59	89	62	100	67	85	58	100	65	102	78	109	78	92	77	88	77
11...	89	40	86	44	104	73	110	70	94	54	97	58	92	60	105	68	89	58	103	63	103	80	107	78	93	79	89	79
12...	89	49	86	43	106	67	107	68	93	55	98	59	93	63	99	63	91	58	95	65	101	78	109	77	91	80	88	79
13...	91	42	84	49	101	68	99	72	85	58	97	58	87	62	96	71	87	56	99	65	99	78	101	76	92	80	87	81
14...	79	41	83	46	99	65	99	68	91	54	94	53	82	60	97	66	86	60	101	60	99	77	103	74	92	77	87	80
15...	81	44	80	46	97	68	100	68	90	56	88	57	86	59	95	69	83	62	92	61	100	68	103	77	92	77	89	79
16...	87	48	82	50	95	69	95	71	89	54	90	52	86	55	92	65	84	58	95	60	97	73	102	75	93	77	89	78
17...	87	44	.....	51	97	68	100	66	89	57	97	54	86	57	95	62	82	62	95	61	93	74	92	73	94	74	91	76
18...	86	44	.....	48	95	68	96	64	86	58	90	55	83	61	93	65	83	61	95	61	94	70	95	65	94	74	87	77
19...	84	55	.....	47	92	64	97	69	86	55	85	54	78	55	92	68	81	60	95	65	93	72	95	72	91	76	87	79
20...	85	48	.....	54	92	66	94	68	85	56	88	59	84	56	91	66	79	67	94	65	94	73	99	73	91	74	91	77
21...	83	47	.....	48	91	69	97	65	88	56	90	56	83	55	94	62	83	58	98	61	95	71	99	73	99	75	92	78
22...	72	54	.....	45	94	67	99	68	84	58	80	57	78	55	92	67	76	58	86	68	85	73	86	69	92	76	88	80
23...	77	50	.....	52	84	68	89	66	71	57	75	57	74	58	85	64	75	55	86	65	90	72	76	64	92	78	86	81
24...	77	51	.....	49	86	66	77	64	65	56	78	51	78	53	75	63	76	56	88	60	94	72	95	68	93	77	86	80
25...	81	46	.....	47	93	69	78	67	77	58	84	58	76	59	80	65	77	54	90	63	94	75	94	72	93	76	87	80
26...	80	47	73	47	93	69	91	68	84	58	81	57	81	57	86	65	76	58	92	63	94	74	92	69	91	80	88	81
27...	81	42	80	48	93	66	94	69	84	55	85	54	81	57	92	64	78	52	93	67	96	76	99	75	91	79	88	81
28...	82	45	80	41	96	64	98	69	81	51	88	52	85	56	94	64	81	56	96	62	96	76	101	75	91	78	87	80
29...	81	47	81	43	95	71	93	69	86	56	93	57	86	56	93	67	85	58	99	59	97	74	98	73	92	76	87	79
30...	87	46	86	45	93	63	94	66	85	54	91	58	84	61	92	63	79	63	98	66	96	74	98	73	92	72	87	76
31...	83	44	71	46	96	70	96	65	85	49	85	52	79	58	94	63	79	56	98	59	95	75	100	73	92	73	90	75
Mns	83.8	45.4	81.3	47.4	94.7	67.8	96.1	67.9	84.9	55.7	88.7	56.0	83.0	58.1	92.2	64.9	81.7	57.8	93.9	63.3	95.4	74.2	97.9	72.7	92.1	76.7	88.1	78.9

Date	Texas.																											
	Del Rio.		El Paso.		Fort McIntosh.		Fort Stockton.		Fort Worth.		Galveston.		Hallettsville.		Houston.		Lufkin.		Palestine.		Plainview.		San Antonio.		Seymour.		Taylor.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1...	88	72	88	73	90	75	94	67	93	77	87	80	97	76	99	75	97	72	90	75	88	64	92	76	82	72	97	75
2...	89	72	88	71	99	81	89	66	92	75	88	81	102	76	100	75	95	72	90	73	87	65	96	74	90	72	98	75
3...	98	74	92	71	101	81	94	64	95	76	87	80	98	76	95	78	94	75	95	73	88	66	102	75	93	72	97	76
4...	99	77	88	70	101	92	98	66	99	90	88	81	95	76	96	75	98	73	96	76	92	65	97	75	96	75	97	74
5...	98	78	93	67	100	86	98	71	97	79	88	82	96	77	92	75	95	73	93	76	94	64	96	76	97	74	95	75
6...	87	72	88	68	99	79	90	71	98	79	88	83	97	76	93	77	94	75	94	76	94	68	97	79	96	77	96	77
7...	91	72	94	70	100	82	89	68	99	78	88	82	99	76	95	76	95	75	95	77	89	64	96	77	96	73	97	76
8...	95	75	94	67	103	80	98	67	100	78	88	81	100	76	99	77	95	73	96	74	93	66	98	76	98	73	98	75
9...	99	77	99	73	105	80	103	72	102	80	88	80	98	76	100	74	97	75	96	75	91	65	100	75	100	74	100	76
10...	100	74	100	75	106	80	107	75	102	80	88	81	99	77	101	75	97	75	96	75	99	68	100	76	103	75	99	75
11...	101	77	101	76	106	80	110	73	104	78	87	82	99	77	99	75	97	73	98	75	101	67	100	74	104	79	100	75
12...	99	76	105	82	104	80	108	75	102	79	88	82	100	76	99	74	97	74	97	77	92	70	98	75	104	75	98	75
13...	96	78	101	77	103	84	94	73	101	78	88	82	100	78	101	75	100	72	98	74	96	68	100	76	103	73	99	75
14...	98	79	98	74	104	80	99	69	101	82	87	82	101	77	100	76	100	74	97	76	96	67	98	77	103	74	99	75
15...	100	79	94	68	105	80	99	70	97	81	88	81	103	76	102	75	97	74	99	76	94	64	101	77	100	73	101	76
16...	98	74	92	71	105	80	100	67	92	79	89	79	101	75	103	74	99	73	96	75	94	69	101	74	99	72	100	75
17...	99	76	93	71	104	78	95	68	96	74	85	76	90	73	97	75	97	72	93	70	92	66	100	75	95	69	100	74
18...	98	75	93	69	101	80	97	67	94	75	86	78	99	73	91	73	92	72	92	73	92	62	95	75	97	72	95	74
19...	90	76	90	71	99	78	95	69	95	75	89	80	98	75	99	74	95	72	93	73	92	64	95	73	97	74	95	73
20...	95	70	92	70	101	78	93	68	96	75	91	79	99	74	99	74	95	70	94	72	92	63	96	73	98	72	98	75
21...	105	72	92	71	102	80	98	65	96	72	84	72	89	75	81	73	92	75	89	74	96	66	98	76	98	74	95	75
22...	88	71	92	70	104	84	91	65	93	76	87	81	94	76	86	75	86	75	87	75	91	67	90	70	91	74	88	67
23...	88	70	80	68	101	80	78	66	94	76	88	82	94	77	94	75	98	72	96	75	83	59	93	76	89	69	92	74
24...	93	73	82	66	101	80	82	66	94	75	85	81	94	75	86	74	89	70	85	74	88	66	93	75	96	70	94	74
25...	93	73	92	66	102	80	88	65	96	77	87	81	94	75	94	75	93	74	93	73	87	65	93	75	100	73	94	75
26...	98	74	90	67	104	80	91	68	96	76	88	82	95	75	93	75	93	74	94	75	84	66	96	76	97	75	93	75
27...	97	76	92	72	105	80	97	67	97	78	88	82	92	77	94	74	94	74	93	76	93	69	95	76	101	76	92	77
28...	97	75	94	69	102	80	94	69	96	77	88	82	93	75	95	75	97	72	96	74	92	70	94	74	101	72	94	75
29...	95	75	92	69	102	80	91	65	97	78	88	82	94	75	92	75	95	73	95	74	90	70	95	74	101	75	95	73
30...	95	74	93	71	100	79	92	65	98	79	87	80	93	74	98	73	95	72	96	75	90	63	94	73	102	74	93	73
31...	97	74	96	71	102	78	95	65	102	80	88	77	93	74	96	74	95	74	96	76	92	66	96	73	101	74	95	74
Mns	95.6	74.5	92.8	70.8	102.0	80.5	95.1	68.1	97.2	77.5	87.5	80.5	96.6	75.6	95.8	74.8	95.3	73.2	94.1	74.5	91.7	65.9	96.6	75.0	97.7	73.4	96.3	74.6